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1966 OPERATING SUMMARY

BRANTFORD

water pollution control plant

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ONTARIO WATER RESOURCES COMMISSION

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Brantford : water pollution
control plant.

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ONTARIO WATER RESOURCES COMMISSION
OFFICE OF THE GENERAL MANAGER

Members of the Local Advisory Committee,
City of Brantford.

Gentlemen:

We are pleased to submit to you the 1966 Operating Summary for the Brantford Water Pollution Control Plant, OWRC Project No. 58-S-11.

It is hoped that our joint participation in efforts to combat water pollution will have even more success in the coming year.

Yours very truly,

D. S. Caverly,
General Manager.

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ONTARIO WATER RESOURCES COMMISSION
801 BAY STREET
TORONTO 5

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VICE-CHAIRMAN

D. S. CAVERLY
GENERAL MANAGER
W. S. MacDONNELL
COMMISSION SECRETARY

General Manager,
Ontario Water Resources Commission.

Dear Sir:

I am happy to present you with the 1966 Operating Summary for the Brantford Water Pollution Control Plant, OWRC Project No. 58-S-11.

The report offers a concise summary of operating data for the year and comparisons with previous years where these are applicable and significant.

Yours very truly,

BCPalmer

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

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1966
MDE

asgl

FOREWORD

● This operating summary contains complete information on the management of the project during 1966. It contains a concise review of the year's plant operation, significant financial details, and a visual presentation in graphs and charts of technical performance.

The information will be of value to interested parties in assessing the adequacy of the project at this time and its ability to meet future requirements.

The report is the result of co-operation by several groups within the Division of Plant Operations. These include the statistics section and the technical publications section. The Division of Finance and the draughting section of the Division of Sanitary Engineering were also closely associated with its publication.

The Regional Operations Engineer, however, has had the primary responsibility for the content, and will be happy to answer any questions regarding it.

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BRANTFORD

water pollution control plant

operated for

THE CITY OF BRANTFORD

by

THE ONTARIO WATER RESOURCES COMMISSION

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Operations Engineer: R. S. McKittrick

801 Bay Street Toronto 5

'66 REVIEW

The operating costs for the Brantford Water Pollution Control Plant in 1966 were $188,867.51 or $75.83 per million gallons treated. The increase in operating costs over 1965 is approximately 1.7%.

A total of 2490.546 million gallons of raw sewage was treated in 1966. This represented an increase of 4% over the 1965 total flow.

Plant efficiencies for the year are based on the plant laboratory results rather than the OWRC central lab as in previous years. Raw sewage strengths were on the average 32% higher than the design estimates by the consultant. The plant effluent, on the basis of available analyses, failed to achieve the OWRC objective for BOD of 15 ppm during the past year.

Difficulty was encountered during the past year in maintaining adequate dissolved oxygen concentrations in the aeration tank. Oxygen transfer tests were conducted by the OWRC Technical Advisory Services Branch from which it was concluded that the present aeration equipment is incapable of transferring sufficient oxygen to maintain a residual DO at the flows and organic loads being received at the plant. A report was initiated in 1966 to deal with this matter.

There was an increase of 26% in the amount of raw sludge pumped to the primary digesters in 1966. Once again there was an insufficient amount of supernatant obtained from the secondary digesters.

The solids determination on the digested sludge was revised during the past year to exclude the chemicals used for coagulation prior to vacuum filtration. Due to this revision there is a marked decrease in the yield in pounds per square foot per hour from the vacuum filters. The cost per ton of dry solids filtered has increased markedly over the 1965 costs. This is due in part to the revised solids determination and also to a more accurate record of actual labour and maintenance costs for vacuum filtration.

Staff reorganization saw the maintenance section cut to three men, one foreman, R. Sherburne, and two maintenance technicians. A second filter operator's position was created, and was filled by W. Reansbury. B. Reansbury was promoted to the position of maintenance technician. Resignations were received from J. Wilkinson, R. Punter and G. McLaughlin. Considerable casual labour was utilized during the summer months to assist in grounds maintenance, and an extensive vacuum filter maintenance program.

There was a considerable backlog of equipment maintenance at the close of 1966. Implementation of a revised preventive maintenance program coupled with the experience gained by Mr. Sherburne during the last quarter of the year should result in a greatly improved maintenance picture in 1967.

PROJECT COSTS

NET CAPITAL COST (Final)	$2,250,950.02
DEDUCT - Payments from Municipalities	493,126.02
Long Term Debt to OWRC	$1,757,824.00
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1966	$ 327,612.51

Net Operating	$ 188,867.51
Debt Retirement	46,653.00
Reserve	11,753.56
Interest Charged	98,899.24
TOTAL	$ 346,173.31

RESERVE ACCOUNT

Balance at January 1, 1966	$ 60,503.72
Deposited by Municipality	11,753.56
Interest Earned	3,422.69
	$ 75,679.97
Less Expenditures	5,104.11
Balance at December 31, 1966	$ 70,575.86

MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDRY	WATER
JAN	10185.75	8479.38				1187.90	191.52	203.13	43.95	79.87	
FEB	13005.64	7544.29		519.55	2137.57	1182.77	409.34	402.06	138.93	671.13	
MARCH	13279.21	8431.83		519.55	2098.69	665.22	297.64		650.83	283.91	331.51
APRIL	22442.43	12554.83			2195.89	3830.14	609.55		159.43	3092.59	
MAY	13913.37	8458.64	296.56		2176.45	676.10	287.20	676.66	179.95	801.42	360.39
JUNE	19229.06	9067.32	439.20	448.27	2182.93	5262.43	315.99	402.17	282.72	898.03	
JULY	18466.55	9806.91	863.76		2866.14	2798.29	481.40		559.92	671.42	418.71
AUG	13052.22	7189.97	1123.44		2084.43	973.34	377.85	28.42	540.21	734.56	
SEPT	17439.22	10959.23	1143.33		1966.17	1219.80	372.81	538.89	573.70	247.46	417.83
OCT	12819.90	7287.65	444.16		2024.49	684.44	290.99		323.03	1765.14	
NOV	14303.76	8142.89	296.12	258.62	2316.85	143.96	579.96		2038.21	220.60	306.55
DEC	20660.40	8230.20	117.17	158.11	4082.90	5059.47	821.45	321.67	323.99	1051.20	494.24
TOTAL	188867.51	106153.14	4723.74	1904.10	26132.51	23683.86	5035.73	2573.00	5814.87	10517.33	2329.23

* SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE $6,500.00

YEARLY OPERATING COSTS

YEAR	M.G. TREATED	TOTAL COST	COST PER FAMILY PER YEAR	COST PER MILLION GALLONS	COST PER L.B. OF BOD REMOVED
1961	2287	$155,644.80	* $11.15	$68.00	4 CENTS
1962	2082	$161,031.47	$11.39	$77.00	4 CENTS
1963	2040	$175,173.29	$12.36	$85.87	7 CENTS
1964	2221	$171,859.76	$12.21	$77.39	6 CENTS
1965	2395	$185,704.83	$12.91	$77.53	6 CENTS
1966	2490	$188,867.51	$12.87	$75.83	4 CENTS

* BASED ON ANNUAL POPULATION ESTIMATE AND 3.9 PERSONS PER FAMILY

VACUUM FILTER COSTS (MONTHLY)

	COST PER MONTH						COST PER TON DRY WEIGHT					
MONTH	$FeCl_3$	LIME	LABOUR	ELEC	MAINT	TOTAL	$FeCl_3$	LIME	LABOUR	ELEC	MAINT	TOTAL
JANUARY	482.86	830.45	1068.34	210.00	218.17	2809.82	3.22	5.54	7.12	1.40	1.45	18.73
FEBRUARY	446.39	995.00	1013.55	188.30	206.98	2850.22	3.32	7.40	7.54	1.40	1.54	21.20
MARCH	664.64	732.65	1095.73	239.40	223.70	2956.18	3.89	4.28	6.41	1.40	1.31	17.29
APRIL	678.09	857.50	1082.04	243.60	220.96	3082.19	3.90	4.93	6.22	1.40	1.27	17.72
MAY	821.46	1121.00	1328.58	298.90	271.31	3841.25	3.85	5.25	6.22	1.40	1.27	17.99
JUNE	733.37	1158.72	1492.93	319.20	304.87	4009.09	3.22	5.08	6.55	1.40	1.34	17.59
JULY	408.34	806.30	1164.22	256.20	237.74	2872.80	2.23	4.41	6.36	1.40	1.30	15.70
AUGUST	369.04	736.75	958.76	240.80	195.79	2501.14	2.15	4.28	5.57	1.40	1.14	14.54
SEPTEMBER	415.77	728.80	903.98	232.40	184.60	2465.55	2.50	4.39	5.45	1.40	1.11	14.85
OCTOBER	*139.12	*266.88	972.46	266.07	198.59	**2608.44	*1.73	* 3.31	5.12	1.40	1.04	** 13.72
NOVEMBER	*186.74	*333.80	1410.75	298.16	288.09	**3554.60	*2.88	* 5.15	6.62	1.40	1.35	**16.69
DECEMBER	482.27	933.00	1205.31	295.61	246.14	3162.33	2.28	4.42	5.71	1.40	1.17	14.98
TOTAL	5828.09	9500.85	13696.65	3088.64	2797.00	36713.61						201.00
AVERAGE PER MONTH	485.67	791.74	1141.39	257.39	233.08	3059.47	2.93	4.87	6.24	1.40	1.27	16.75

* POLYELECTROLYTE USED IN OCTOBER AND NOVEMBER.

** TOTALS INCLUDE POLYELECTROLYTE PRORATED ON THE BASIS OF $7.00 PER TON OF DRY SOLIDS FILTERED.

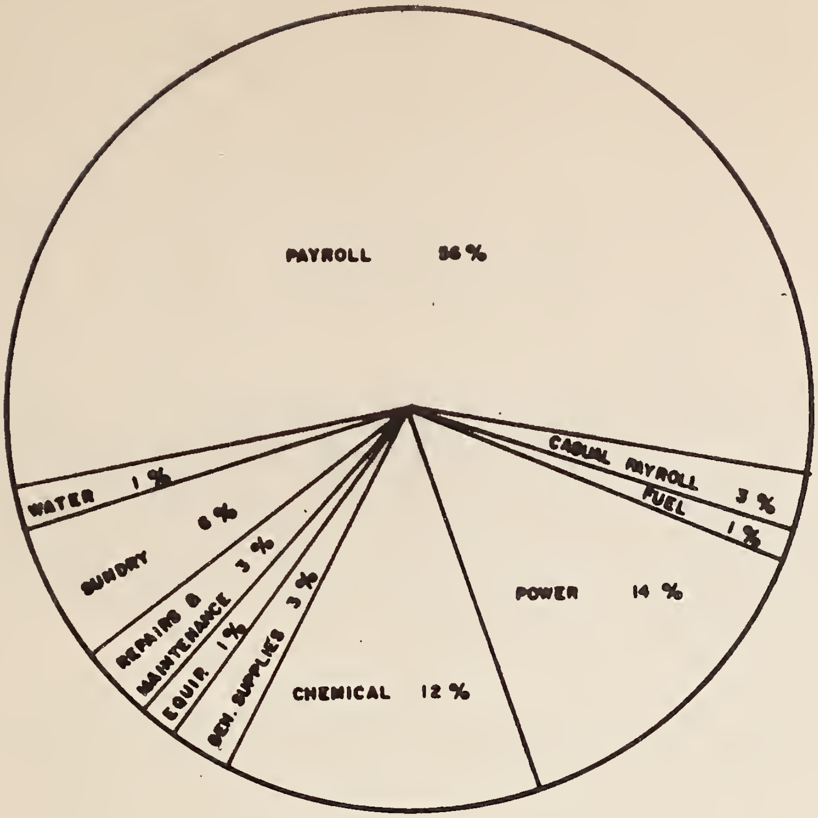
COMMENTS

The costs as recorded in the above table are considered to be the most reliable estimate to date on the vacuum filter operation at Brantford. Chemical, labour and maintenance costs are based on labour and material records for the year. The one cost which is still estimated is that for power requirements.

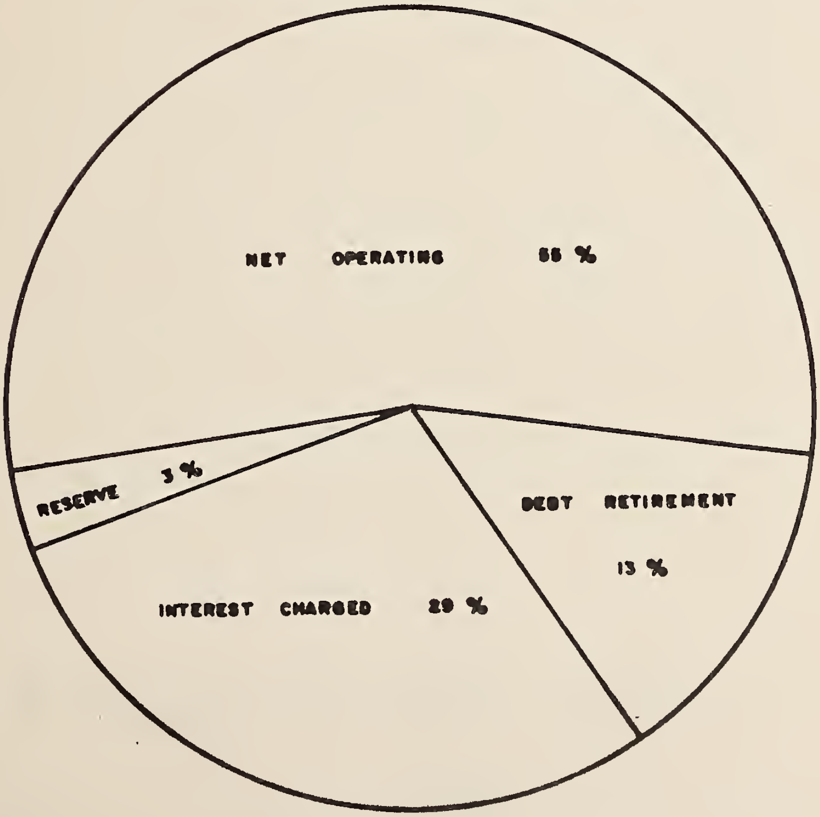
The vacuum filter costs in terms of tons of dry solids filtered are also affected in 1966 by the change in method of determining solids concentration in the digested sludge as noted in the comments for the Vacuum Filter Operation chart.

The cost per ton of dry solids filtered was $16.75 in 1966 as opposed to $11.06 per ton in 1965.

1966 OPERATING RESULTS



TOTAL ANNUAL COST

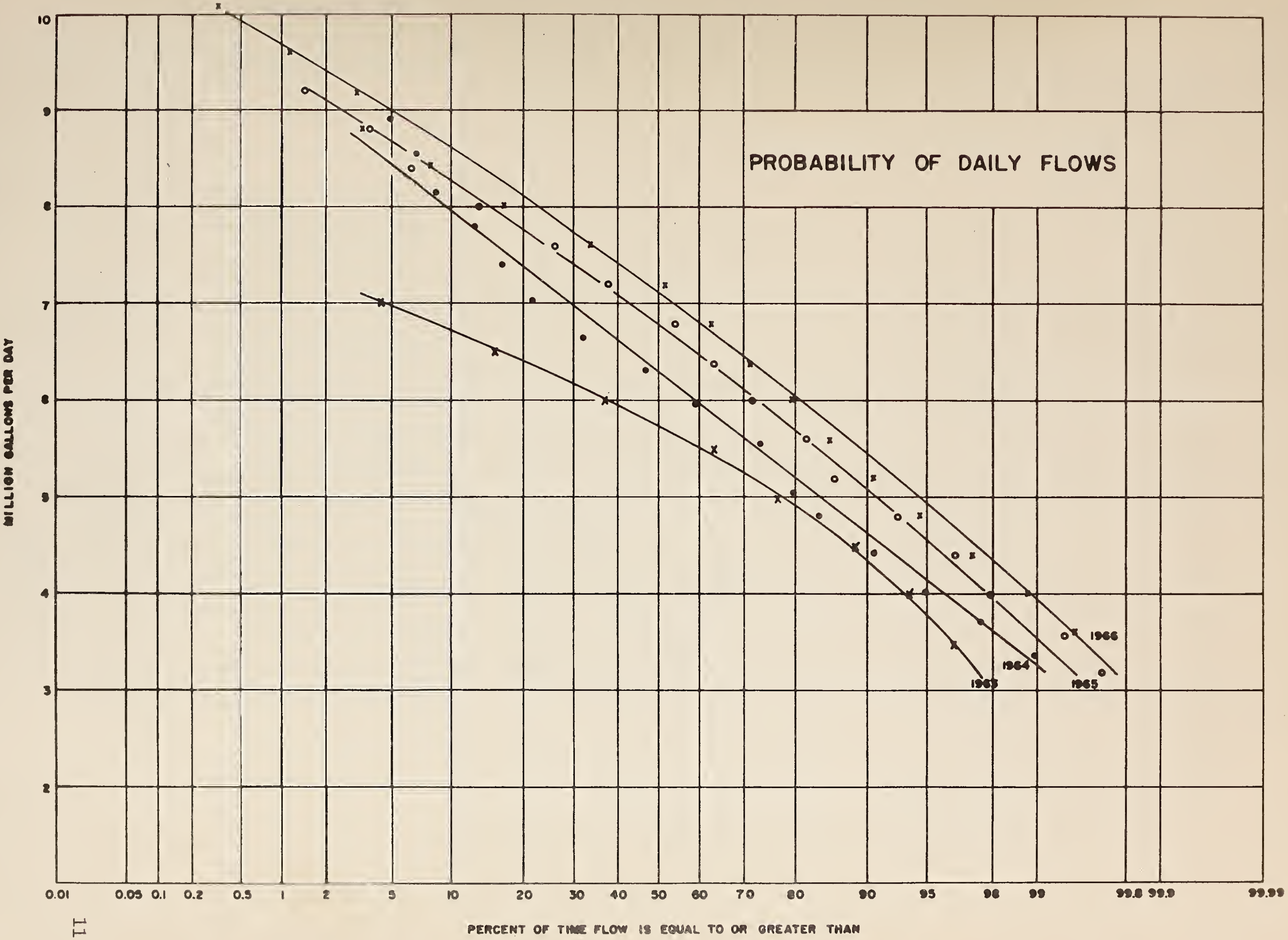


Process Data

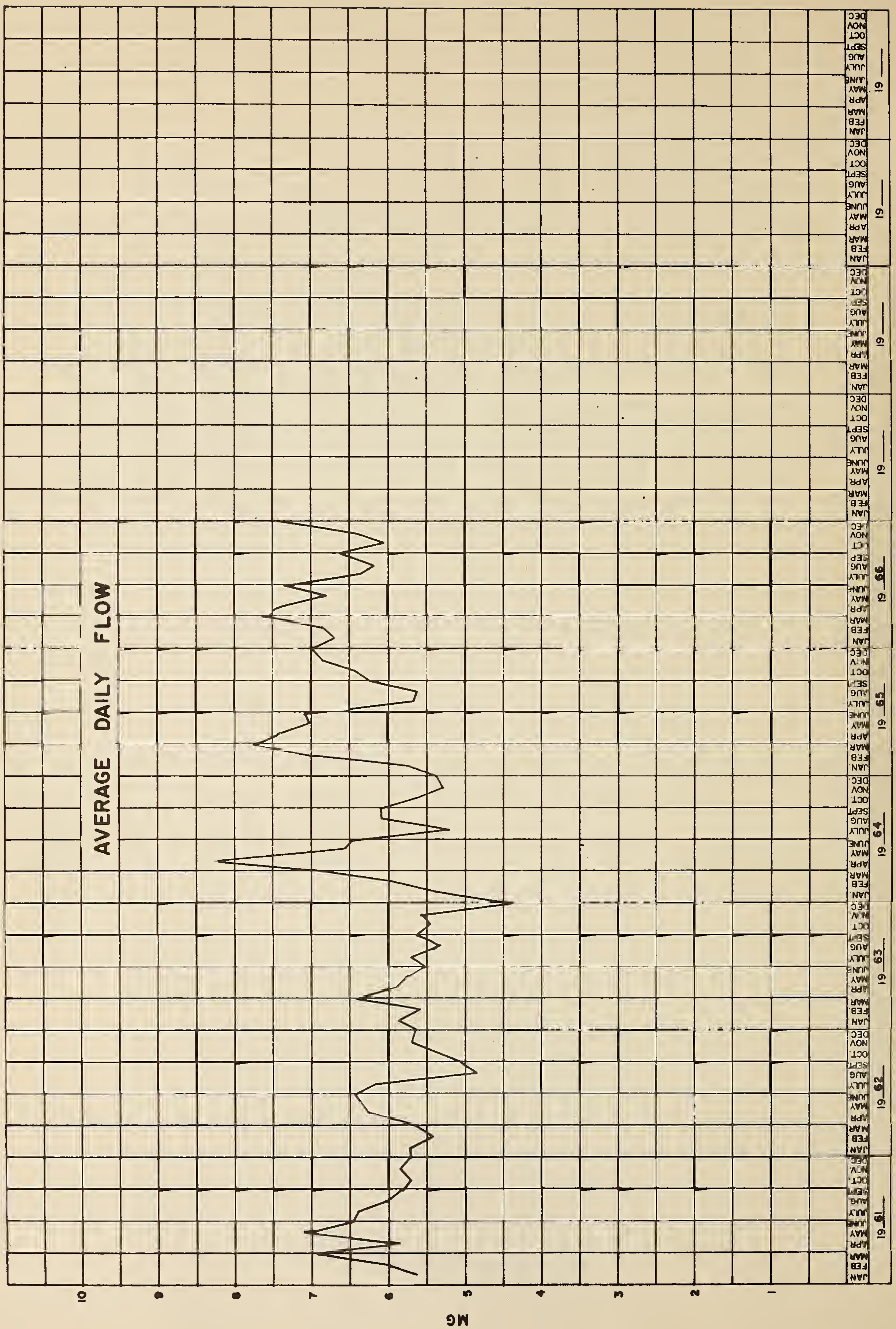
Flow

A total of 2490.546 million gallons of raw sewage was treated at the Brantford plant in 1966. This represents an increase of 4% over the 1965 total flow. The average daily flow for the year was 6.82 million gallons. The average daily flow based on a five day work week, and excluding statutory holidays, was 7.33 mg or a 60% hydraulic load factor. The maximum total flow for a month of 237.149 mg or an average daily flow of 7.65 mg occurred in March, and the maximum daily flow for the year of 10.813 mg occurred on December 9.

The two flow graphs and one flow data chart provide a complete summary of flows at the Brantford plant in 1966 along with a comparison of flows from previous years.



PROBABILITY OF DAILY FLOWS

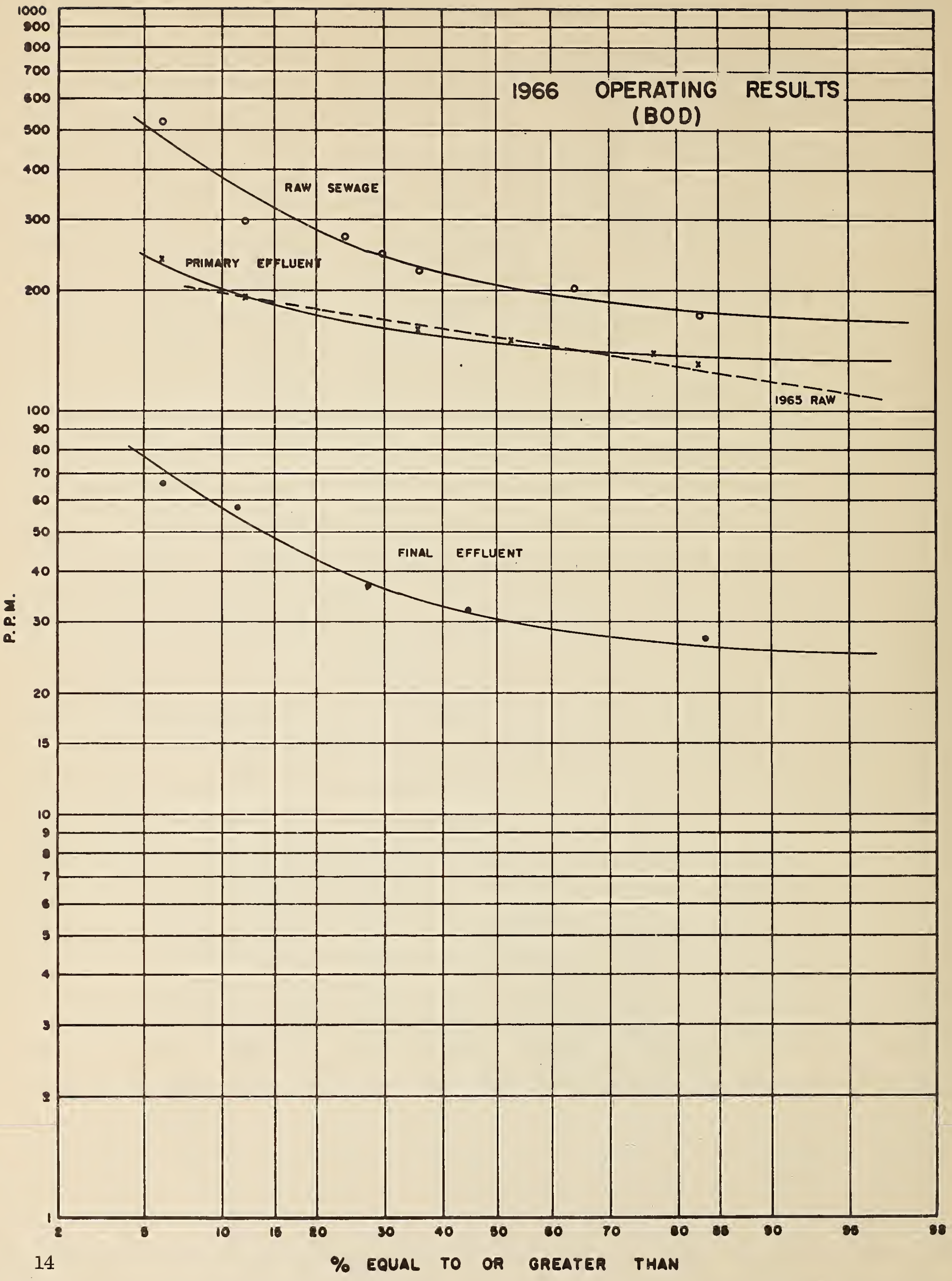

AVERAGE DAILY FLOW
MG
10
9
8
7
6
5
4
3
2
1
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
19 61
19 62
19 63
19 64
19 65
19 66
19
19
19
19

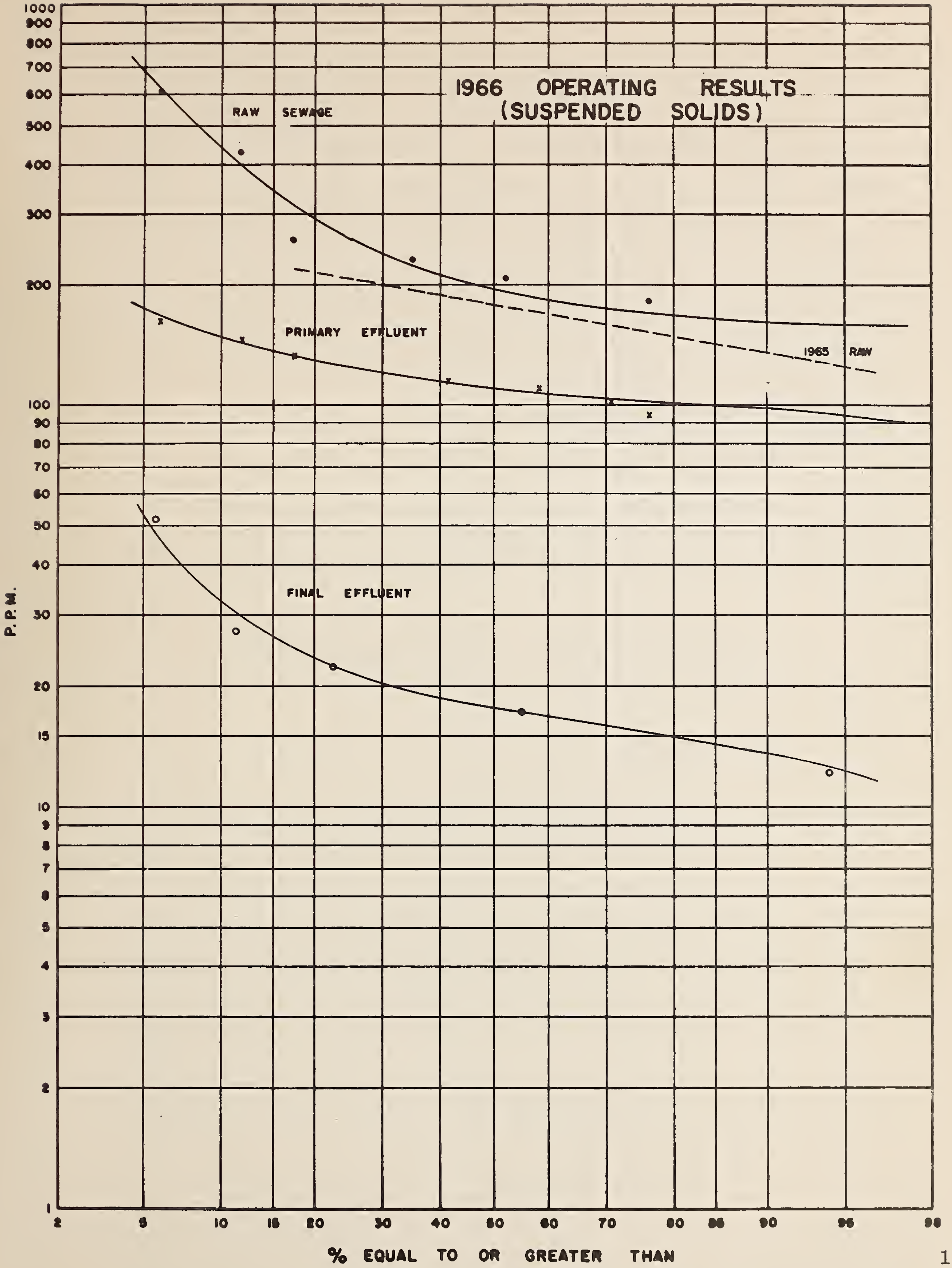
FLOW DATA

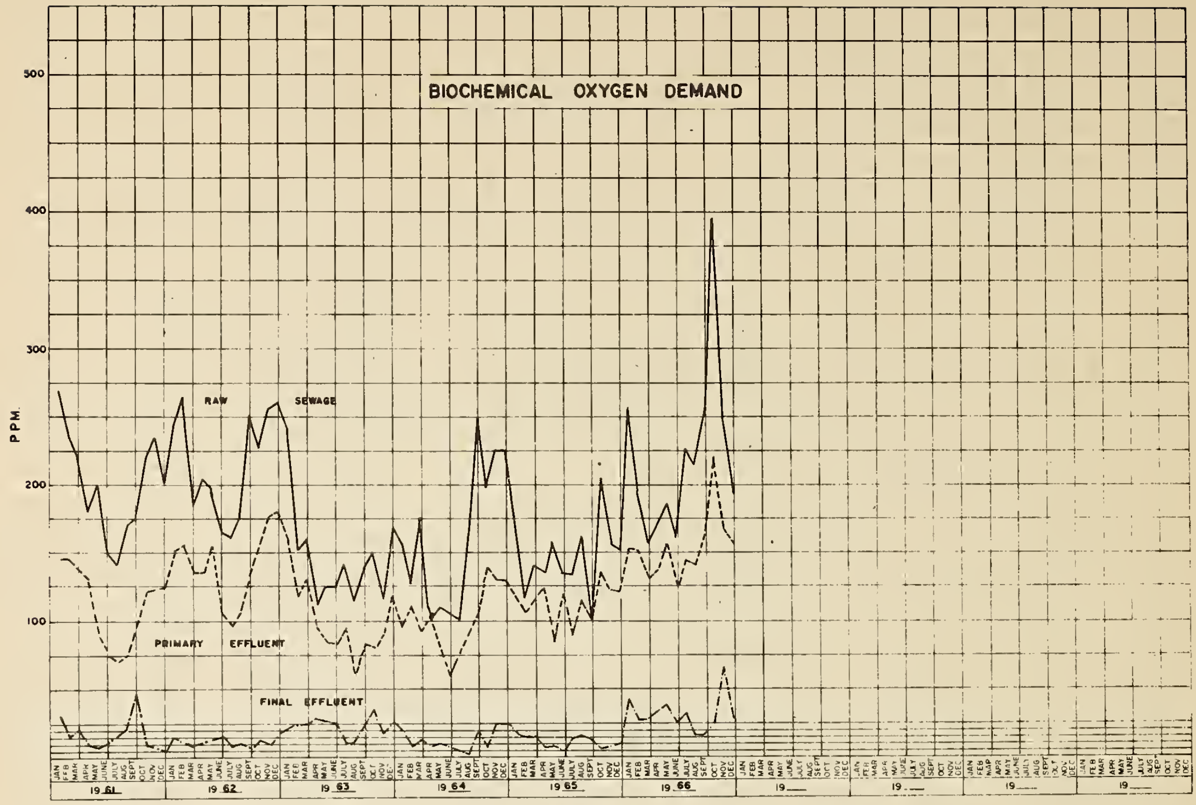
Month	Total Flow MG	Max. Day for Month MG	Max. Rate for Month MG	Min. Day for Month MG	Min. Rate for Month MG	Avg. Daily for Month MG
January	207.980	8.790	13.000	4.350	3.500	6.710
February	193.040	8.500	13.600	4.870	3.300	6.890
March	237.149	9.207	12.800	5.541	3.100	7.650
April	220.929	8.585	13.000	5.510	3.700	7.364
May	211.797	8.200	15.200	4.429	3.000	6.832
June	220.642	9.000	15.400	4.673	2.400	7.354
July	196.444	8.297	16.500	3.138	1.600	6.337
August	191.716	7.712	16.500	3.025	1.100	6.184
September	199.459	9.140	13.600	4.079	2.400	6.648
October	188.127	7.704	15.400	3.949	2.400	6.068
November	192.294	7.584	20.300	4.395	2.300	6.409
December	230.969	10.813	16.500	3.803	1.600	7.450
TOTAL	2490.546	-	-	-	-	-
AVERAGE	207.546	-	-	-	-	-

Year	Total Flow MG	Max. Daily MG	Min. Daily MG	Avg. Daily MG
1960*	1651.0	8.60	3.96	5.39
1961	2287.0	8.05	2.50	6.26
1962	2080.0	7.90	3.26	5.70
1963	2040.0	9.50	2.36	5.59
1964	2221.0	9.78	2.78	6.07
1965	2395.0	11.12	2.74	6.57
1966	2490.0	10.81	3.02	6.82

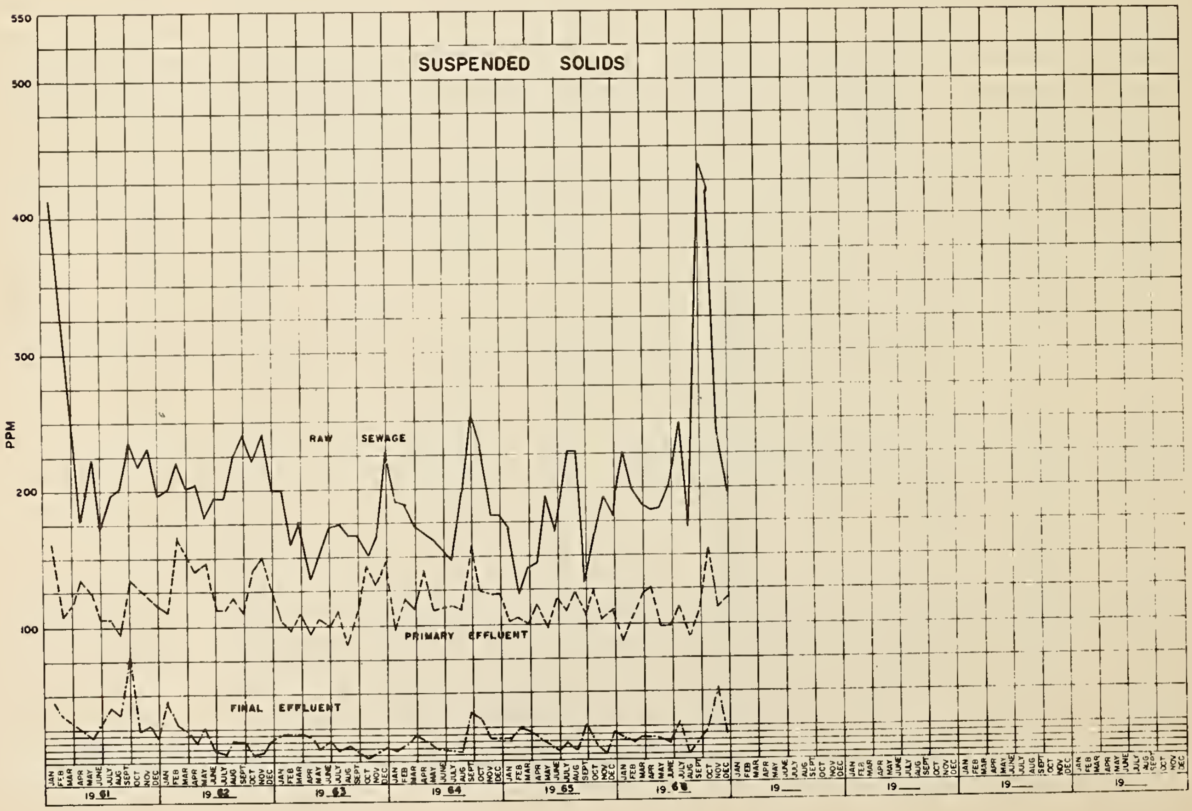
* 10 month's data only


1966 OPERATING RESULTS (BOD)
RAW SEWAGE
PRIMARY EFFLUENT
1965 RAW
FINAL EFFLUENT
P.P.M.
1000
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
15
10
9
8
7
6
5
4
3
2
1
2
5
10
15
20
30
40
50
60
70
80
85
90
95
98
% EQUAL TO OR GREATER THAN


1966 OPERATING RESULTS
(SUSPENDED SOLIDS)
RAW SEWAGE
PRIMARY EFFLUENT
1965 RAW
FINAL EFFLUENT
P.P.M.
1000
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
15
10
9
8
7
6
5
4
3
2
1
2
5
10
15
20
30
40
50
60
70
80
85
90
95
98
% EQUAL TO OR GREATER THAN



MONTHLY VARIATIONS



GRIT, B.O.D AND S.S. REMOVAL

MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT P.P.M.	EFFLUENT P.P.M.	% REDUCTION	TONS REMOVED	INFLUENT P.P.M.	EFFLUENT P.P.M.	% REDUCTION	TONS REMOVED	
JAN.	258	42.0	83.5	224.6	226	16.5	92.5	217.8	349
FEB.	194	27.8	85.5	160.4	198	13.7	93.0	177.9	200
MAR.	156	29.0	81.5	150.6	187	17.4	90.5	201.1	472
APR.	172	34.0	80.0	152.4	184	17.0	90.5	184.5	495
MAY	186	39.0	79.0	155.7	185	15.8	91.5	179.2	396
JUNE	164	26.0	84.0	152.2	202	13.0	93.5	208.5	463
JULY	226	29.0	87.0	193.5	248	28.8	88.5	215.3	861
AUG.	214	17.1	92.0	188.7	170	4.0	97.5	159.1	663
SEPT.	279	17.0	94.0	261.3	438	12.9	97.0	424.0	1166
OCT.	395	24.1	94.0	348.9	419	20.8	95.0	374.6	601
NOV.	249	66.0	73.5	176.0	240	52.0	78.5	123.1	472
DEC.	191	25.8	86.5	190.8	190	18.2	90.5	198.4	270
TOTAL	-	-	-	2398.4	-	-	-	2762.0	6408
AVG.	224	31.4	86.0	199.9	241	19.2	92.0	230.2	534

COMMENTS

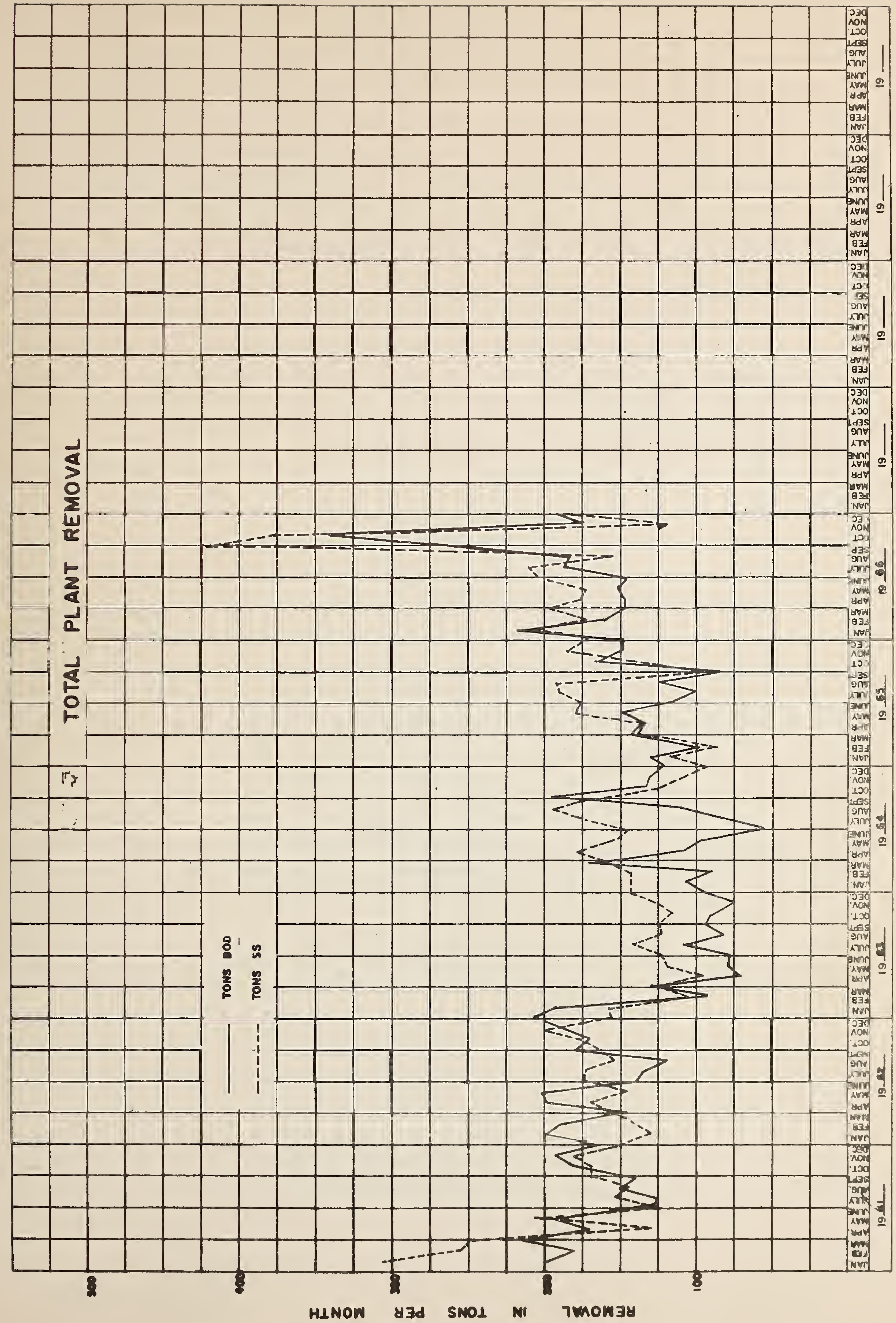
Analytical results in the above chart are from the plant laboratory rather than the OWRC central laboratory at Islington and Highway 401. This is a change from previous years. Composite sampling and analysis of the raw sewage, primary effluent and final effluent is on a bi-weekly basis. The samples are composited over an 8-hour period from the month of July with an allowance made for detention time throughout the plant. The period until July was 24 hours.

During 1966, the average BOD of the raw sewage was 224 ppm as opposed to a design estimate of 170 ppm. The suspended solids averaged 241 ppm.

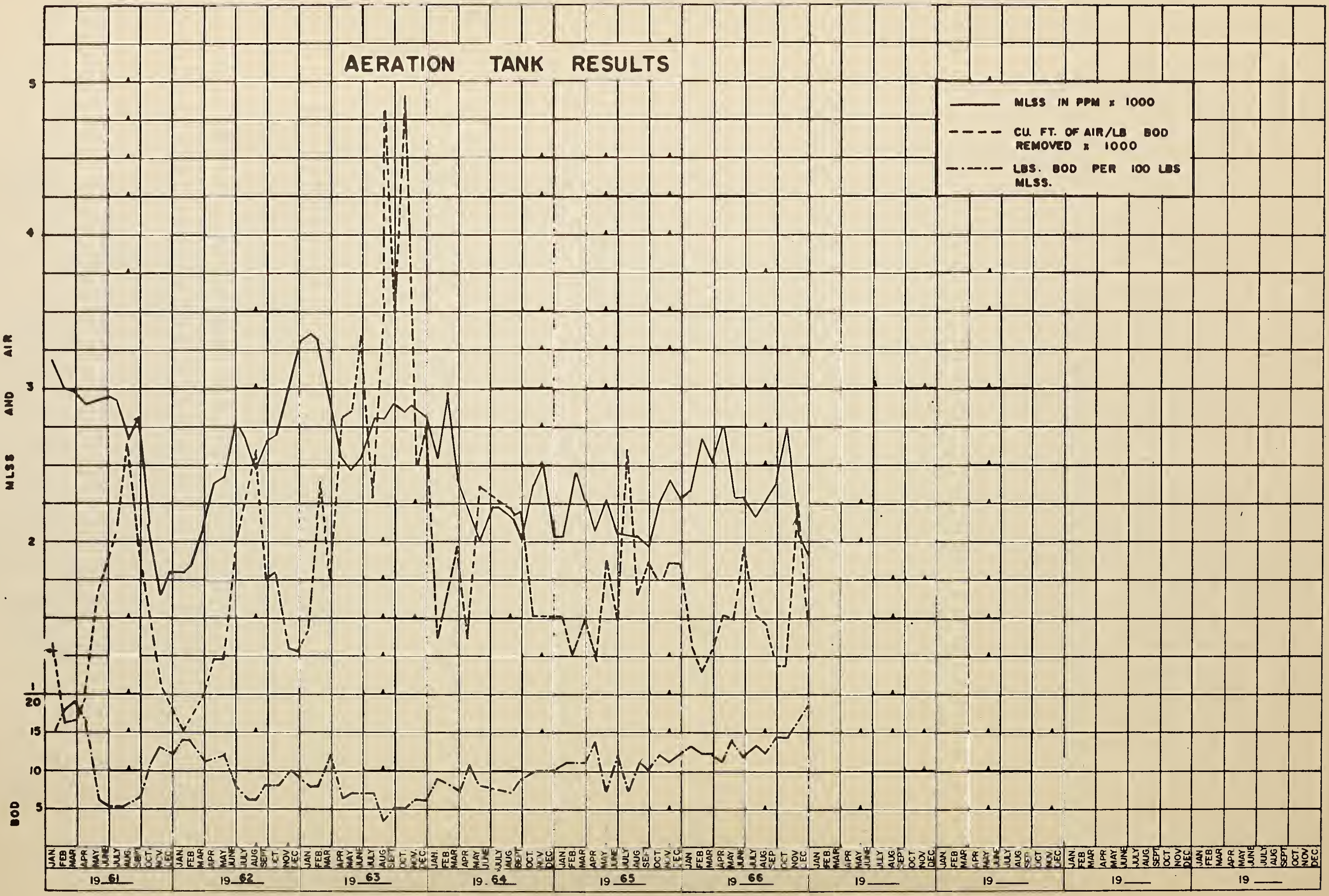
as opposed to a design estimate of 175 ppm. Effluent strengths averaged 31.4 ppm BOD and 19.2 ppm SS. OWRC objectives for effluent from an activated sludge type sewage treatment plant are 15 ppm for both BOD and SS. As noted in the chart, the Brantford plant, on the basis of available analyses, failed to achieve the objective for BOD.

A total of 2398.4 tons of BOD was removed in 1966 as opposed to 1604.9 tons in 1965. This increase of 49% can be attributed partly to our change in policy whereby calculations are now based on plant laboratory results (which have proven to be consistent with and slightly higher than OWRC central laboratory results) and partly to increased flow and stronger raw sewage.

An average of 2.6 cubic feet of grit per million gallons of raw sewage was removed which is a slight increase over the 2.5 cubic feet in 1965.


TOTAL PLANT REMOVAL
TONS BOD
TONS SS
REMOVAL IN TONS PER MONTH
500
400
300
200
100
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
19 61
19 62
19 63
19 64
19 65
19 66
19
19
19

AERATION TANK RESULTS



AERATION SECTION

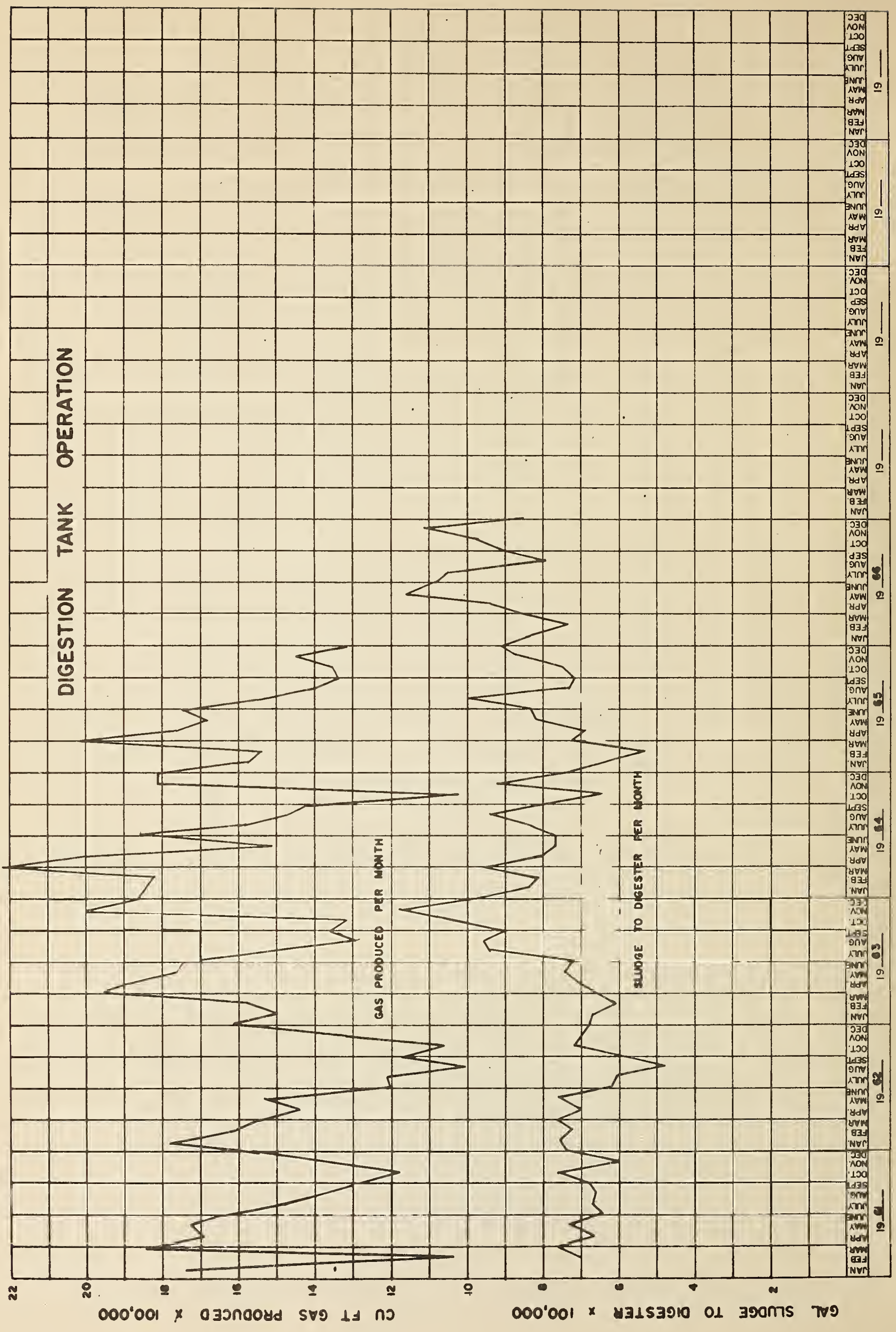
MONTH	PRIM. EFFL B.O.D. P.P.M.	M.L.S.S. P.P.M.	LBS. BOD. PER 100 LBS. M. L. S. S.	CUBIC FEET AIR PER LB. B.O.D. REMOVED
JANUARY	156	2354	14	1347
FEBRUARY	152	2703	12	1149
MARCH	130	2509	12	1291
APRIL	136	2757	11	1503
MAY	158	2292	14	1498
JUNE	123	2295	12	1957
JULY	145	2156	13	1534
AUGUST	142	2279	12	1450
SEPTEMBER	163	2390	14	1180
OCTOBER	219	2799	14	1188
NOVEMBER	168	2066	16	2226
DECEMBER	156	1917	18	1490
TOTAL	-	-	-	-
AVERAGE	154	2376	14	1484

COMMENTS

The primary clarifier removal efficiency for BOD was 31% for the year. The mixed liquor SS fluctuated between a high of 2757 ppm and a low of 1917 on a monthly average basis. The aeration tank loading averaged 14 lbs. of BOD per 100 lbs. MLSS as compared to 11 in 1965. The cubic feet of air supplied per lb. of BOD removed was slightly reduced from 1581 to 1484.

Due to a lack of adequate dissolved oxygen content in the aeration tanks, expecially in the summer months when biological activity is greatest, three blowers were operated for two periods last year (normal operation is two blowers). The first trial began on June 10 and continued to July 1. Two significant points were noted. First, all the air from the three blowers could not be put through the Sparjer diffusers and a complete cleaning of the Sparjers was scheduled. Secondly, there was no significant increase in the dissolved oxygen concentration. Following the Sparjer cleaning, the three blowers were operated for a second time in October from the 6th to the 14th. During this trial, personnel were on site from the OWRC Technical Advisory Services Branch to conduct oxygen transfer tests. It was concluded following these tests that the present diffusers were capable of transferring 3% of the supplied oxygen to the mixed liquor . From this it was further concluded that the present aeration equipment is incapable of transferring adequate oxygen to maintain a residual DO at the flows being received at the plant.

A report was initiated in 1966 to deal with the observed inadequacies of the Brantford secondary treatment.


DIGESTION TANK OPERATION
22.52
GAS PRODUCED PER MONTH
SLUDGE TO DIGESTER PER MONTH
CU FT GAS PRODUCED x 100,000
GAL SLUDGE TO DIGESTER x 100,000
22
20
18
16
14
12
10
8
6
4
2
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
19 61
19 62
19 63
19 64
19 65
19 66
19
19
19

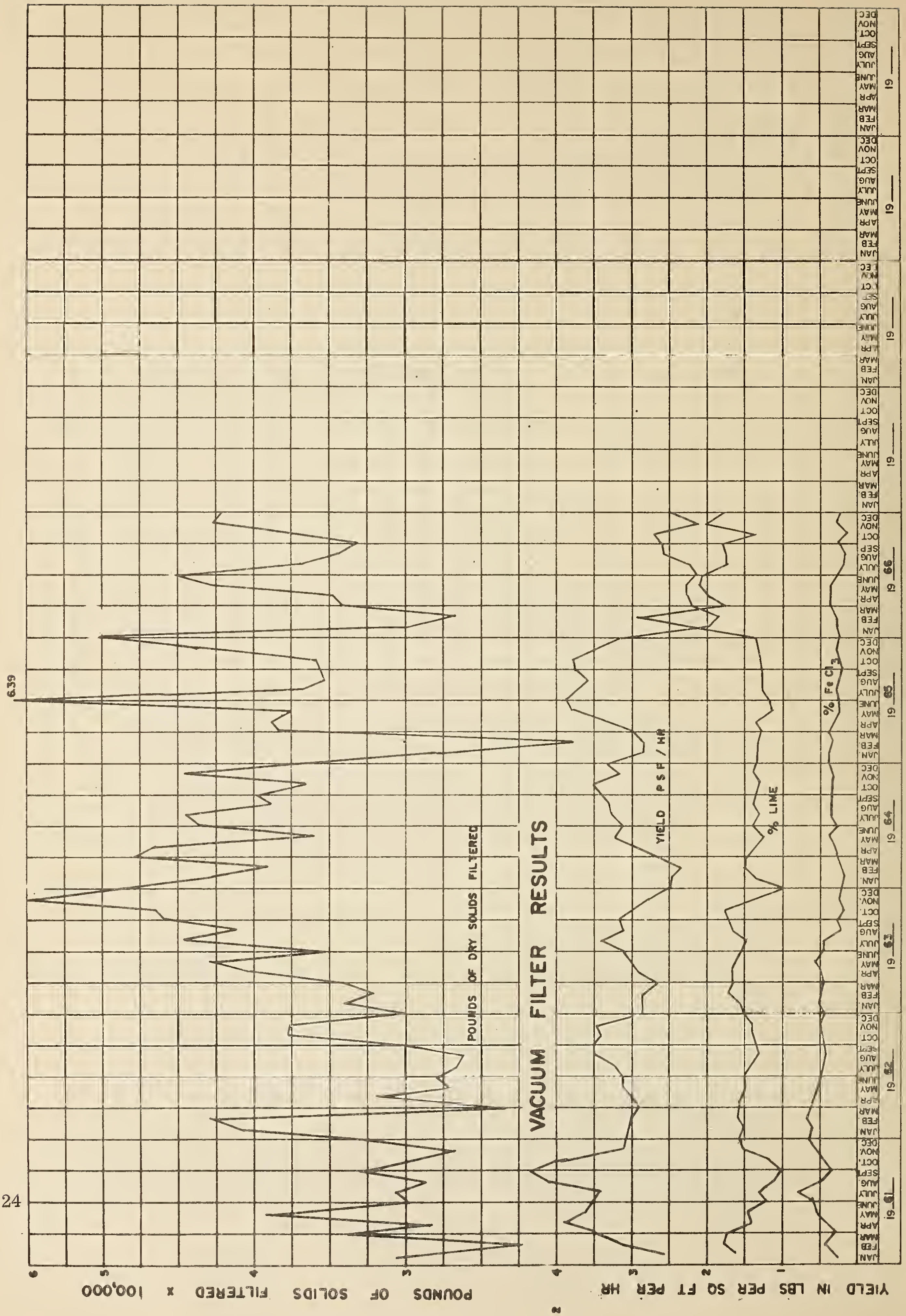
DIGESTER OPERATION

MONTH	SLUDGE TO DIGESTERS			SLUDGE FROM DIGESTERS			GAS PRODUCED 1000'S Cu. Ft.
	1000'S CU FT.	% SOLIDS	% VOL. MAT.	1000'S CU. FT.	% SOLIDS	% VOL. MAT	
JAN	133.59	5.32	3.66	120.47	4.04	2.42	-
FEB.	118.39	5.69	3.82	109.51	3.96	2.32	-
MAR.	138.33	6.08	4.09	117.79	4.64	2.65	-
APR.	150.51	5.33	3.68	129.69	4.36	2.56	-
MAY	186.96	5.08	3.41	158.61	4.30	2.56	-
JUNE	173.45	5.03	3.26	182.77	4.12	2.43	-
JULY	167.96	5.57	3.52	140.94	4.24	2.46	-
AUG.	127.35	5.57	3.54	122.49	4.52	2.50	-
SEPT.	147.24	5.18	3.36	115.96	4.53	2.50	-
OCT.	155.60	4.95	3.37	78.37	4.20	2.30	-
NOV.	176.98	4.40	2.64	168.79	4.06	2.31	-
DEC.	135.84	5.39	3.72	163.80	4.10	2.34	-
TOTAL	1812.20	-	-	1609.19	-	-	-
AVG.	151.02	5.30	3.51	134.10	4.26	2.45	-

COMMENTS

A total of 1,812,200 cubic feet of raw sludge was pumped to the primary digesters in 1966. This is an increase of 26% over 1965. The average solids content in the raw sludge of 5.95% in 1965 was reduced to 5.30% in 1966. The 1,609,190 cubic feet of digested sludge to the vacuum filters resulted in 4,412,337 pounds of dry solids. The amount of supernatant obtained from the secondary digesters was, as in past years, considerably lower than is desirable. The percent reduction in volatile matter in the digesters averaged 30 for the year. Based on an actual detention time of 18 days in the primary digesters, a volatile reduction of this order is to be expected.

There was no record of gas production in 1966. Cost of repairs to the original gas meters is prohibitive and other more economical gas metering devices are being considered.


VACUUM FILTER RESULTS
POUNDS OF DRY SOLIDS FILTERED
YIELD P S F / HR
% LIME
% Fe Cl$_3$
6.39
POUNDS OF SOLIDS FILTERED x 100,000
6
5
4
3
YIELD IN LBS PER SQ FT PER HR
4
3
2
1
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
19 61
19 62
19 63
19 64
19 65
19 66
19 __
19 __
19 __
19 __

VACUUM FILTER OPERATION

MONTH	FILTER HOURS		% SOLIDS DIGEST SLUDGE	LBS. DRY SOLIDS FILTERED	** LBS. LIME	** % LIME	LBS. $FeCl_3$	% $FeCl_3$	% SOLIDS FILTERED SLUDGE	YIELD PSF/HOUR
	#1	#2								
JAN.	217.75	213.33	4.04	300,000	66435	22.1	8184	2.7	17.1	1.99
FEB.	200.70	212.50	3.96	269,000	79600	29.6	7566	2.9	16.9	1.86
MAR.	226.55	217.63	4.64	342,000	58611	17.1	11265	3.3	17.9	2.20
APR.	219.99	220.25	4.36	348,000	68600	19.7	11493	3.3	17.9	2.26
MAY.	271.50	265.25	4.30	427,000	89680	21.0	13923	3.3	17.6	2.27
JUNE	330.00	272.78	4.12	456,000	92698	20.3	12430	2.7	17.8	2.16
JULY	125.15	346.87	4.24	366,000	64505	17.6	6921	1.9	18.9	2.21
AUG.	155.50	233.16	4.52	344,000	58940	17.1	6255	1.8	20.6	2.52
SEPT.	241.08	127.25	4.53	332,000	58305	17.6	7047	2.1	19.8	2.58
3-11 OCT.	64.20	74.65	4.20	161,431	21350	13.2	2358	1.4	19.8	3.26
17-31	46.15	209.73	4.20	218,665	*15774	-	-	-	16.1	2.15
1-22 NOV.	141.65	258.09	4.03	296,302	*17611	-	-	-	14.9	2.07
23-30	74.33	97.66	4.09	129,635	26705	20.6	3165	2.4	18.2	2.14
DEC.	242.25	245.25	4.10	422,304	74640	17.7	8174	2.0	17.3	2.45
TOTAL	2556.80	2994.38	-	4412,337	760069	-	98781	-	-	-
AVG.	213.07	249.53	4.26	367,695	63339	19.5	8232	2.5	18.0	2.28

* POLYELECTROLYTE TESTS WERE HELD BETWEEN OCTOBER 17 AND NOVEMBER 22. THE VOLUMES MARKED WITH ASTERISKS ARE POLYELECTROLYTE (LBS.)

** LIME IS EXPRESSED AS 100% CAO

COMMENTS

A change made in the sampling location for determining the percent solids of digested sludge has markedly altered previous information on yield rates from the vacuum filters. Prior to 1966, the sample for determining the solids concentration in the digested sludge was taken from the filter vat and thus included the chemicals, particularly lime, used in sludge conditioning. When sampling was altered to give solids in the sludge prior to the addition of chemicals, the solids concentration dropped from an average in 1965 of 6.11% to 4.26% in 1966. This resulted in a proportionately lower yield rate of 2.28 pounds of dry solids per square foot of filter area per hour.

Again in 1966 lime and ferric chloride were the prime chemicals for coagulation of the sludge. However, polyelectrolytes were used on a trial basis for a period of 37 days with little success. Further plant trials are planned for 1967.

The trend which began in 1965 towards greater lime requirements continued in 1966 to a high of 29.6% of pure CaO. However it should be kept

(Continued on page 26)

CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (P.P.M)
JANUARY	207.980	4766	2.29
FEBRUARY	193.040	4268	2.21
MARCH	237.149	4774	2.01
APRIL	220.929	4582	2.07
MAY	211.797	4520	2.13
JUNE	220.642	4303	1.95
JULY	196.444	3526	1.79
AUGUST	191.716	4681	2.44
SEPTEMBER	199.459	* 2530	1.65
OCTOBER	188.127	4870	2.59
NOVEMBER	192.294	4602	2.39
DECEMBER	230.969	5094	2.20
TOTAL	2490.546	52516	-
AVERAGE	207.546	4376	2.15

*23 days data. Chlorinator out of service

COMMENTS

Chlorine is added to the final effluent for disinfection on a year-round basis. A chlorine dosage of 2.15 ppm was required to maintain a residual of 0.5 ppm after 15 minutes.

VACUUM FILTER OPERATION

(Continued from page 25)

in mind that as the percent lime dosage is calculated in relation to the pounds of dry solids filtered the change in the sampling location for solids concentration in the digested sludge as pointed out earlier, altered the lime dosage values. Thus the increase in average lime dosage in 1966 to 19.5% is due in part to an actual increase in lime consumption and in part to the change in method of determining the solids concentration in the digested sludge.

The ferric chloride requirements were reduced in 1966 but once again the degree of reduction must take into account the knowledge that the solids concentration in the digested sludge was determined in a slightly different manner.

CONCLUSIONS

It was concluded in 1966 that existing aeration equipment is incapable of supplying the oxygen requirements to the secondary treatment process under existing flow and organic loading conditions. Although a full report has not yet been completed it appears obvious at this time that modification of the equipment probably through the installation of fine bubble diffusers will be required if the plant is to treat existing loads adequately and handle future requirements.

Field trials utilizing polyelectrolytes as the coagulant for vacuum filtration were not successful in 1966. Further trials are scheduled for 1967 in hopes that adequate results and costs can be obtained. Revised vacuum filter costs have made the disposal of digested sludge in its liquid form much more attractive. The major obstacle to this proposal is a suitable dumping location.

The quality of the effluent from the Brantford Water Pollution Control Plant did not meet Commission objectives for BOD content during 1966. This can be primarily attributed to the problems encountered with the aeration section during the past year. An improvement in the efficiency of oxygen transfer should see a corresponding improvement in the final effluent quality.

Improvement is required in the maintenance program at the plant. Implementation of a revised preventative maintenance program together with a more efficient maintenance crew should see considerable improvement.

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